

Submillimeter-Wave Spectrometer for Small Satellites (SSSS)

Completed Technology Project (2016 - 2020)



Project Introduction

This effort matures critical technologies for reducing the size, mass and power consumption of submillimeter-wave instruments to enable integration in to a small satellite or cubesat platform.

The key technology is a low the cost, mass, volume and power consumption of submillimeter-wave spectrometer. This new technolgy be appropriate to studying the Venusian or other planetary atmospheres from a small-sat/cubesat platform.

Anticipated Benefits

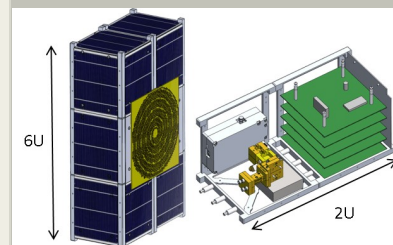
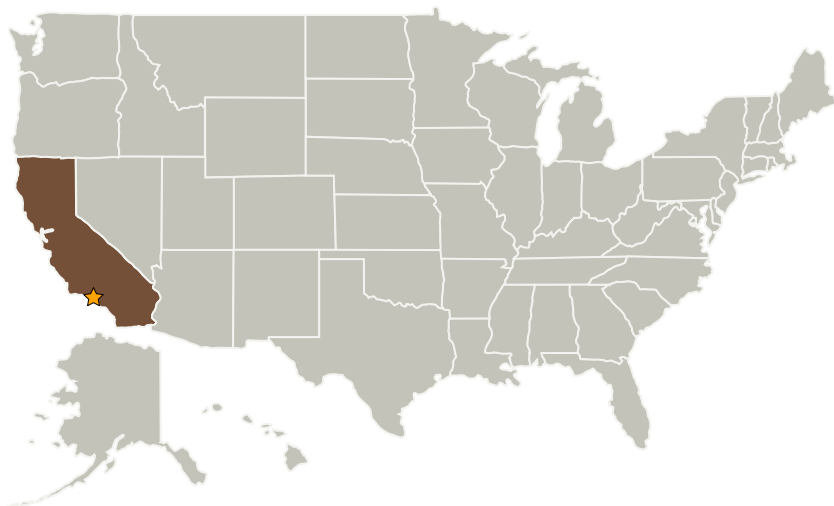
This technology can radically reduces the mass, volume and power consumption of future submillimeter-wave radiometers and spectrometers.

The flat antenna development could be used for future telecommunication antennas. The antenna development could be used to improve telecommunications systems, particularly as they move to higher frequencies.

The waveguide calibration switch could be used in submillimeter-wave metrology systems.

Submillimeter-wave instruments provide unique information about the chemistry of the atmosphere. By reducing the cost, access to these instruments to study the Earth's atmosphere is increased.

Primary U.S. Work Locations and Key Partners



(Left) The flat antenna developed in this project can be directly integrated onto the side of a Small-/Cube-Sat for reduced mass and volume.
(Right) The integration of the receiver with the waveguide calibrator.

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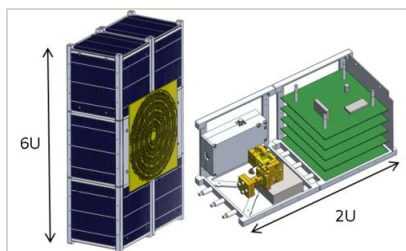


Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations

California

Images



JPL_IRAD_Activities Project Image

(Left) The flat antenna developed in this project can be directly integrated onto the side of a Small-/Cube-Sat for reduced mass and volume. (Right) The integration of the receiver with the waveguide calibrator. (<https://techport.nasa.gov/image/27990>)

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Independent Research & Development: JPL IRAD

Project Management

Program Manager:

Fred Y Hadaegh

Project Manager:

Fred Y Hadaegh

Principal Investigator:

Theodore J Reck

Co-Investigators:

Goutam Chattopadhyay
 Brian J Drouin
 Cecile Jung-kubiak
 Adrian J Tang

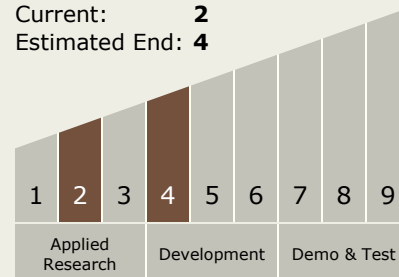
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Technology Maturity (TRL)

Start: 2
Current: 2
Estimated End: 4



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

Earth, The Moon

Supported Mission

Type

Push